

## CLAIMS

We claim:

1. A method for forming carboxylate-alumoxane nanoparticles, comprising:  
subjecting a mixture comprising boehmite and carboxylic acid to mechanical shear.
2. The method according to claim 1 wherein the method is carried out at a temperature above ambient.
3. The method according to claim 1 wherein the method is carried out at a temperature greater than 80°C.
4. The method according to claim 1 wherein the method is carried out substantially in the absence of a liquid phase.
5. The method according to claim 1 wherein the carboxylate-alumoxane particles are formed within two hours of initiation of shear application.
6. The method according to claim 1 wherein the carboxylate-alumoxane particles are formed within one hour of initiation of shear application.
7. The method according to claim 1 wherein the mixture is heated by the application of heat from an external source.
8. The method according to claim 1 wherein the mixture is heated by the application of heat from an external source and by the application of mechanical shear.
9. The method according to claim 1 wherein the carboxylic acid is selected from the group consisting of an aliphatic carboxylic acid, an aromatic carboxylic acid, and a carboxylic acid containing an additional chemically reactive functional group.

10. The method according to claim 1 wherein the mixture is subjected to mechanical shear by passing it through a tube at a linear velocity of at least about 1,000 ft/min.
11. The method according to claim 1 wherein the mixture is subjected to mechanical shear by passing it through a device comprising a rotor and a stator.
12. The method according to claim 1 wherein the carboxylate-alumoxane nanoparticles have an average size of less than 200 nm.
13. The method according to claim 1 wherein the carboxylate-alumoxane nanoparticles have a size distribution such that the particle size range is  $\pm 20\%$  of the average size.
14. Carboxylate-alumoxane particles produced by the method according to claim 1.